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ABSTRACT

This speech offers a guide to identifying and teaching high-risk children, those who exhibit a lag in development severe enough to be a handicap in learning. The high-risk children focused on are those whose developmental lag is frequently not recognized until they fail in school. The two major areas of neurodevelopmental learning disorders are in perceptual-motor development and language development. Specific instruments useful for identifying high-risk children in early childhood are listed. Teacher indicators of deficiencies in both major areas are listed. Before intervention can be successful, teachers must be able to assess developmental levels of motor and language skills. A curriculum model based on concept development is presented. It assumes that perception is the basis of learning and uses the sensory systems to develop conceptual understandings. A concept, such as apples or sharing, is selected, and the classification and relational concepts related to it are identified. The major areas of conceptual development are properties, position, opposites, quantification, comparisons, associations, time, and motion. Expected outcomes in such areas as auditory and visual perception, reading readiness, gross motor development, and writing are described. References are provided. [Filmed from best available copy.] (KM)

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Identify and Assist the Development of High Risk Preschool Children

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Developmentalist Point of View

Before one can speak to identification, intervention and evaluation of high risk children one must first develop a theoretical rationale upon which these processes shall be based. The early childhood staff at the University of Virginia operates from a psychological base that is developmental in nature in that our rationale for identification of educational outcomes for young children are derived from learning theory and experimental evidence of psychology and child development which includes contributions from many disciplines: physiology, anthropology, sociology, pediatrics, psychology so our view point is not only developmental but interdisciplinary.

A developmentalist is interested in the changes in behavioral and physical dimensions as a function of age and/or stage. We are as interested in describing how the child is behaving and how he is learning as well as the specific content of what he is learning. Although content is important it often serves as the means for the process. In other words, we're not so concerned that it's more important for the child to learn about apples than artichokes, but more important is the development of and broadening of classification categories and skills that develops from the study of the concept.

If one subscribes to developmental psychology, one is aware that performance by which developmental ontogenies are developed is considered to be the norm. Children will fluctuate greatly in their development and a child below norm level is not necessarily deviant. The advantage of knowledge of the developmental sequence is to be able to locate the operating level of the child and then environmentally broaden his skills of that level and/or assist him to the next level. The concern of the adult is not whether the child is behind or ahead of the norms, but rather where is he and how can the child be assisted to acquire new skills for which he is developmentally ready. The failure of many remedial programs in the public schools rests in lack of knowledge of the developmental sequence and providing intervention programs that do not meet the child's operating level developmentally. How a child develops can be viewed sequentially in the major areas of development (those of motor, visual perceptual, language, cognitive and social).

Even though there are considerable individual differences among children in their rate of development, wide discrepancies in the growth of abilities are unusual and should be further investigated. It is in these wide discrepancies of development that we find high risk children.

The concept of developmental lag or discrepancies is supported by various research with young children. In Woodward's studies (1959, 1962) of severely defective children she found that Piaget's

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sensorimotor period of normal children up to 18 months of age can be found in severely defective children at a much older chronological age. While it is easier to detect developmental discrepancies in older children there is some evidence that mildly-braindamaged children can be detected at a very young age. Honzik's study (1962) was designed to compare success and failure patterns on the Bayley Infant Mental and Motor Scales of infants suspected of neurological deficits, with those of normal infants. When the babies were tested at 8 months Honzik found that there were some test items passed by the high risk babies more frequently than the control group of normal infants. The high risk babies passed a larger proportion of the verbal and social items while the normal infants passed more items involving alert attentiveness and adaptive response to the test materials. As early as 8 months we see the high risk babies making a differential response to their world which seems to be due to differences in the visual-motor perceptual ability. Longitudinal research is presently being done by several institutions to look at individual differences at birth and how these affect later development. Horwitz (19), Birch (19).

According to Denhoff and Robinault (1960) in their book about cerebral palsied children, true perceptual disorders are always of organic origin but this is not to say that they are irremediable. If developmental intervention is begun during pre-school years, these developmental discrepancies may be corrected so as not to cause a deficit. If, however, treatment is delayed until the age of 6 or 8 or later, they may be straightened out, but meanwhile they confuse regular school learning. Unless developmental discrepancies are detected early and help is given, disturbances which may seriously affect the overall development of the individual may become established, rather than corrected during the formative period when they are most remediable. It is the critical period concept in that there is a stage in development when a skill can be better learned than at any other time in the developmental sequence.

Developmental discrepancies seem to exist in children of all ages from mild deviation which is considered "normal" through extreme deviation which is judged as handicapping or pathological. It is those children whose developmental characteristics are felt to be handicapping that we are calling "high risk". "High risk" children range from the borderline types I will speak of today to those children who are obviously blind, deaf, autistic, mentally retarded, etc. Without direct intervention in these children's developmental pattern the probability of their becoming handicapped and needing special education services is extremely high. By identifying developmental discrepancies at an early age when they can be ameliorated it will enable many prelabeled children from becoming labeled special education children when they reach school age.

Who are High Risk Children

Before we talk about who are these high risk children it is of interest to see how many high risk children there are. Many times statistics raise the importance of an issue. Last March, Representative Charles Vanik (D-Ohio) released statistics which showed that state and Federal authorities were able to identify, counsel, and place in educational facilities only 40 percent of the handicapped children birth through 21 years of age. Public schools exclude an estimated 4 1/4 million handicapped children or 60 percent of the school-aged handicapped children in the country. This overlay shows the breakdown by states of those children served and unserved.

ESTIMATED NUMBER OF HANDICAPPED CHILDREN SERVED AND UNSERVED
1971-72 (AGED 0 TO 21 YEARS)

State	Total served	Total unserved	Grand Total
Alabama	22,384	88,765	111,149
Alaska	1,875	3,175	5,050
Arizona	12,678	27,318	40,059
Arkansas	12, 492	109,173	121,665
California	321,765	219,320	541,085
Colorado	37,566	38,289	75,855
Connecticut	35,544	54,322	89,866
Delaware	8,351	7,371	15,722
District of Columbia	9,568	12,334	21,907
Florida	105,021	34,822	139,843
Georgia	65,061	64,803	129,864
Hawaii	9,106	10,484	19,590
Idaho	8,395	28,166	36,561
Illinois	180,877	74,504	255,381
Indiana	86,599	58,492	145,091
Iowa	36,521	58,210	94,731
Kansas	27,713	26,853	54,566
Kentucky	24,336	54,050	78,386
Louisiana	45,056	77,288	122,344
Maine	6,758	23,985	30,743
Maryland	66,259	57,380	123,639
Massachusetts	63,460	45,152	108,612
Michigan	165,018	123,279	288,297
Minnesota	70,423	52,242	122,665
Mississippi	16,587	99,479	116,166
Missouri	65,110	156,468	221,578
Montana	5,358	18,242	23,600
Nebraska	23,734	69,834	93,568

State	Total served	Total unserved	Grand Total
Nevada	6,300	7,340	13,640
New Hampshire	6,070	13,304	19,374
New Jersey	99,189	131,866	231,055
New Mexico	8,655	44,471	53,126
New York	221,219	151,592	372,811
North Carolina	73,739	98,841	172,580
North Dakota	89,470	38,268	47,215
Ohio	175,300	160,578	335,898
Oklahoma	23,746	120,840	144,586
Oregon	26,274	21,770	48,044
Pennsylvania	156,830	106,619	265,449
Rhode Island	13,475	26,000	39,475
South Carolina	38,275	68,230	106,505
South Dakota	4,414	13,381	17,795
Tennessee	49,173	82,730	131,903
Texas	175,622	602,069	777,731
Utah	27,079	17,100	44,179
Vermont	4,612	16,019	20,631
Virginia	44,768	101,980	146,748
Washington	64,223	15,071	79,294
West Virginia	15,161	65,400	80,561
Wisconsin	66,230	89,583	155,813
Wyoming	5,655	12,810	18,475

(The preceeding graph was taken from the March 8, 1972 edition of Report on Preschool Education, page 10)

One must also remember these are those children that have been identified and the children we will be speaking of today many times are not identified until they fail in school. Also, statistics do not tell the quality of the care or educational intervention.

Obviously, the deaf, blind, cerebral palsied, the autistic children are high risk in terms of normal academic learning and normal adjustment to society. The high risk children I will focus on today are those whose developmental lag is not so readily identifiable. These are the children that almost all teachers have and don't know what to do with in terms of educational intervention.

Paine (1965) described high risk children as those showing irregularly impaired cerebral function usually referred to as an "organic pattern" which could conceivably exist as a uniform disability in different areas of function but which usually shows striking discrepancies from one area to another. In other words, these high risk children have partial brain damage usually in the motor, perceptual, or language areas causing a discrepancy in development between these areas.

These are difficulties which often make up the principal barrier to academic performance in children with cerebral palsy or epilepsy and which can also exist by themselves in more borderline form.

Jessie Francis-Williams (1970) published her findings on years of research with young children with specific learning difficulties. She defines these learning difficulties as neurodevelopmental when they occur in children of normal intelligence. She considered her population to be neurodevelopmental because although many of the children were identified by psychological tests as having specific learning disorders similar to those of children with known neurological impairment there was no evidence of such impairment in some of these children. What was evident was an indication of maturational lag and disorderly development. It is this that needs to be recognized in planning suitable learning programs to prevent specific learning disabilities becoming fixed. She has defined 2 major areas of neurodevelopmental learning disorders and it is these that we shall focus upon today:

The first area of learning disorders is that of perceptual-motor development.

(a) Children displaying poor and disorderly development of visual perception. These do not necessarily correlate with peripheral defects of vision such as would be diagnosed by the opthamologist. Discrepancies in the visual perceptual area are seen in difficulties in recognizing shapes and patterns, matching blocks according to their shape and size. They also have difficulty in recognizing position and distinguishing figure from background in interpreting pictures and also orienting themselves as individuals in space. These children have difficulty making the transfer of meaning they derive two-dimensional pictures to three dimensional objects they represent.

(b) Children with poor motor coordination. As a result of which their visual-motor skills are poor and they are handicapped in many areas of learning. The child's difficulty when affected by visual-motor disorders lie in carrying out motor tasks which require visual control of guidance. These visual-motor abilities are required for constructional tasks. These discrepancies particularly show up when the child has to reproduce letters, write number in a column, etc.

(c) If a child has difficulty in both perception and manipulation of spatial relationships he is said to have visual-spatial disorder. This is disturbed orientation in regard to structure, shape, and size. It is thought to be related to perceptual disorders which could not be entirely accounted for by disorders of movement nor entirely related to such physical disabilities as deafness, total or partial vision, squints, defective speech, epilepsy or low intelligence. These are children classified by some professionals as clumsy or children with minimal cerebral palsy. Their difficulties in learning the basic school subjects arise mainly from delayed or distorted development of spatial ability--disorders in both perception and the manipulation of spatial relationships.

The second group consists of children whose learning disabilities arise from language disorders:

(a) Children with disorders caused by some degree of auditory imperception, or handicap in speech arising from developmental dysphasia, either receptive, expressive or both. In children whose severe language lag cannot be explained on the basis of deafness, emotional deprivation or mental retardation, delayed language and speech development is one of the earliest and more sensitive indicators of a child with organic neurological impairment. Many times these children are normal in every other aspect of development. Dysphasia is different from childhood aphasia which is loss or impairment of language after it has been acquired in the normal manner. And developmental aphasia is failure to acquire language due to mental retardation or brain injury occurring before, during, or after birth.

(b) Children with disorders resulting from developmental dyslexia--the term currently used for very severe reading difficulty thought to have a genetic origin. It is sometimes called congenital word blindness. Following are some of the characteristics of dyslexia.

1. It is not related to peripheral visual defect.
2. It is not related to peripheral auditory defect.
3. It can occur in children of any level or intelligence.
4. It is not related to visual-spatial disability.
5. It is closely associated with delayed language development.
6. It is characterized by reversals of letters and confusion in the order of letters in words long after the normal child, through the process of maturation, has outgrown these difficulties, so that children with specific developmental dyslexia continue to have difficulty in sequencing and orientation.
7. It is thought by some to be associated with undefined cerebral dominance. (Francis-Williams, 1970).

Generally speaking children who have severe difficulty in learning to read are slow to speak and late also in comprehending speech, so that this kind of reading disability could be regarded as a disorder of the most highly developed functions of language and language skills. In fact, the child is developmentally not ready to read. His language skills are at a lower developmental level. If a child is speaking in phrases it does not make sense to expect him to read sentences.

These 5 major conditions overlay in various ways in children. However, one of the striking characteristics of many brain-damaged children who have visual-spatial disability is the extent to which their language development remains unrelated to the development of their visual-perceptual abilities. This was evident in the Honzik study. These conditions are all thought to be due basically to either congenital conditions causing maturational delay, or to cerebral damage at birth or in early infancy. The important thing to understand is that regardless of cause there is a developmental delay that will contribute to difficulties in academic tasks at higher developmental levels if the developmental gap is not filled.

Identification: Instruments

It is often difficult to identify high risk children as normal children rarely perform evenly throughout the whole range of their abilities. Therefore it's difficult to distinguish a child with neuro-developmental learning disorders from one who is developing motor skills at a sudden rapid rate - and is temporarily plateauing in language development - If however, one had been observing the child over time it would not be as difficult to determine.

Today, I will simply suggest standardized tests that can be used to diagnose - and some teacher observations cues that may suggest high risk behaviors in borderline and high risk children.

Perceptual and Motor Instruments.

Developmental Test of Visual Perception

Frostig, M., Consulting Psychologists Press, Palo Alto: California, 1966.

This test consists of five subtests with developmental norms - from 3 to 9 years of age.

1. Eye motor - detects difficulty in writing.
2. Figure-ground - difficulty in recognizing words
3. Constancy of shape - difficulty in recognizing letters when in different sizes or colors.
4. Position in space - reversals on rotations
5. spatial relationships - interchanging the order of letters

Visual perceptual - recognition of forms on Stanford Binet - at 4 1/2 level.

Bayley Scales of Infant Development - Bayley (1969)

The scales (motor scales, mental scale, and behavior record) are designed to provide a tripartite basis for the evaluation of the child's developmental status in the first 2 1/2 years of life.

The motor scale is designed to provide a measure of the degree of control of the body, coordination of the large muscles and finer manipulatory skills of the hands and fingers. Results are expressed as a standard score.

Purdue Perceptual Motor Survey - Roach & Kephart (1966)

This survey has a total of 22 scorable items within the three major areas of laterality, directionality, and skills of perceptual motor matching.

Laterality : awareness within the body of right and left.

Perceptual Motor Matching: comparison of perceptual information with information already existing in the organism. Reception, contour, form, and spatial content is measured.

Directionality : This subtest measures right - left, up - down, and before-behind process of perceptual projection outside the body.

Denver Developmental Screening Test, Frankenburg, W. and Dodds, J.B.

This test assesses gross motor, fine motor, adaptive, language and personal - social development. It's intent is to detect serious developmental delays in young children.

Tactual-Localization Test adaptation of Bender's Face-Hand Test (1953)

In this test objects in the environment, a part or 2 parts of the child's body are touched and the child is asked to identify the object or body part which has been touched. This test detects body image difficulties.

Developmental Tests of Visual-motor Integration

Beery Geometric Form Reproduction (measures visual motor integrity and requiring copying of designs which systematically progress in difficulty from a simple straight line to complicated figures.)

Wechsler Intelligence Scale for children (Wechsler, 1940)

Block Design - WISC and WPPSI - this subtest requires the child to sort as well as assemble geometric forms into a pattern. Most young children grasp the idea of a surface pattern, but has some difficulty with the three dimensional forms. The two sided surfaces on the WPPSI are more appropriate for younger children.

Object Assembly - This test requires the child to put things together into a familiar configuration. It is a way of observing how a person perceptually deals with part-whole relationships.

Discrimination of Forms - This subtest requires the child to find like forms.

Bender-Gestlat Test for Young Children - (Koppitz) (1957)

This instrument measures fine motor coordination, spatial orientation, perception, possible signs of neurological dysfunction.

Copying forms by Graham et al (1963)

This test consists of 18 forms which the child is asked to copy. The test is scored for reproducing certain general features of the design. The main emphasis of the scoring system is on accurate reproduction of 4 characteristics: general configuration, orientation on the background, size relationships of parts and intersections.

Teacher indicators of deviant development in the perceptual and motor areas.

Perceptual -

1. Difficulty in recognizing shapes or patterns

Motor -

1. Clumsiness and awkwardness of movement.
2. Bumping into, knocking over and spilling things.
3. Difficulties of manual dexterity in putting on shoes, coats, tying shoe laces and fastening buttons, in holding pencil.
4. Delayed sense of body image.

Visual-motor -

1. difficulty in reproducing patterns and shapes from memory or copy.
2. difficulty in copying simple structures built in bricks
3. difficulty in putting puzzles together.
4. difficulty in recognizing position.

Visual Spatial

Lady Francis-Williams (1970) suggests that if the following characteristics in varying combinations would suggest that aschool age child (6,7,8,) with a developmental lag of discrepancy and his learning problems in school are due to brain pathology and/or to normal slow development in children of school age.

1. Discrepant psychological test patterning: for example, in the

Wechsler Pre-school and Primary Scale of Intelligence and also in the Wechsler Intelligence Scale for Children, facility in language, difficulty in block design, object assembly and coding and frequently poor arithmetic.

2. If verbal score is 20 or more points higher than performance, poor school achievement in reading, spelling, and writing, compared with the overall Verbal IQ.
3. Difficulty in right-left discrimination.
4. Clumsiness in movement - games, running, catching balls and in fine motor coordination, such as is required in using a knife and fork or in clear speech articulation.
5. Difficulty in dressing, buttoning coat, tying shoes and bows.
6. Loss of figure-ground discrimination in pictures or in reality.
7. Disturbed orientation in recognizing position.
8. Difficulty in copying, sorting, recognizing and matching shapes and structures.
9. Psychological disturbances usually associated with cerebral palsy, preserveration, short attention span, distractibility. Fluctuation in performance.
10. Disturbance of body image, e.g., difficulty in relating one part of the body to another.
11. Judging distance of real objects in the environment.

Language Development Instruments

Phonetics. These tests are used to determine if child is producing sounds incorrectly or which sounds are misarticulated in a child's speech. Measures for assessing phonetic development include:
No-Howe Speech Test for English Consonant Sounds, Smith, 1957.
Goldman-Fristoe Test of Articulation - This test assesses articulation of consonant sounds. Although it's not designed to specifically study vowel and diphthong production, all vowels and all except one diphthong are measured so deviations can be noted. Appropriate for children between 4 and 8 years of age.
Developmental Articulation Test - Henja, 1955-Consonant articulation in single words, blends excluded, is measured by this test.
Poole Consonant Test - this is a test that can be constructed by classroom teachers. It tests consonant sounds - the beginning, middle, and end positions. The teacher can make picture cards for the nouns used and administer the test herself. Poole (1934).

Semantics. Perhaps the best standardized test of vocabulary is the Stanford Binet. For developmental assessment the following sequence is suggested:

Cattell Infant Intelligence Scale
Stanford Binet picture vocabulary subtest
Stanford Binet definitions subtest

Menyuk's Scale. Menyuk (1964) formulated a scale based on the Chomsky model. His model has a three level structure which includes phrase level, transformation level and a morphological level. Each of these three levels of grammar has a sequence of rules which generate the sentences within the level. Recordings of child's speech can be analyzed with this scale.
Lee's Developmental Sentence Types. Lee (1966) proposed a method of analyzing language samples that was based upon the work of Braine (1963) Brown and Bellugi (1964), McNeill (1955) and Chomsky (1957). The Developmental Sentence Types is a model that attempts to illustrate the progression that the child might go through from his early two word combinations to the use of the noun phrase, verb phrase, and other

grammatical forms as independent elements or kernel sentences from which transformations will be derived. By using this instrument one can obtain the following information:

a. Identify the grammatical categories of the population's language.
b. Determine which categories are used more consistently than others by the child.
c. Which categories are acquired at an earlier or later age by children.

For the purposes of diagnosing the developmental syntax level of the child the Lee's Developmental Sentence Types determines the categories that the child uses most frequently. This instrument has been found to be an adequate framework for analysing language samples that are a dialect of standard English. This enables the study of the language development of the ghetto child, Applachian child, or bilingual child.

Northwestern Screening Test. The NSST is a quick screening device to make an estimate of syntactic development. It can isolate those children between 3 and 8 years of age who are sufficiently deviant in syntactic development to warrant further analysis. The NSST measures both receptive and expressive use of syntactic forms, using identical linguistic structures in both parts of the test.

Fluency. Teacher indicators for fluency:

1. The child does not respond until encouraged...
2. The child responds with one or more spontaneous remarks but cannot continue...
3. The child responds with one or more spontaneous remarks and continues with another remark or two when requested...
4. The child responds freely, continues when requested and is highly productive.
5. The child's responses are a level 3 or 4 but he includes the teacher in a conversational manner...

Teacher Observations. Signals - in 3-5 year old children showing deviant language development.

1. Lack of clarity of speech even in communication with familiar teacher and children who they regard as friends.
2. Clear sppech articulation.
3. Failure to use language as a symbolic process and to integrate its use into performance of other learning tasks.

Auditory Perceptual Skills. The best assessment of whether a child is hearing or not is done by an audiologist. For children who are too young for standardized tests teacher made tests such as sound boxes where the child puts the boxes that sound the same together are appropriate. The teacher can create her own means of measuring each specific auditory perceptual outcome which are identified later in this paper.

The two most common auditory discrimination tests used with young children are the Wepman and Goldman-Fristoe. The Wepman particularly has been considered questionable in terms of validity. Both of these instruments require a common vocabulary and don't account for cultural synonyms, therefore, culturally different and very young children do not score well on these tests. However, if a teacher uses them as tools to learn more about the child's auditory abilities and child is not penalized due to different vocabularies.

Wepman Auditory Discrimination Test - This test measures recognition of fine differences between phonemes. It utilizes paired words which must be identified by the child as "same" or "not the same." The child receives no visual cues as the word pairs are given to him.

Goldman-Fristoe Test of Auditory Discrimination -

Intervention

Once we've identified these high risk children, how are we going to intervene.

Intervention as defined by Sigel (1972) is the introduction of planned programming deliberately timed and arranged in order to alter the anticipated or projected course of development. Such projection is, in effect, a set of assumptions beginning with a definition of the subject's population's current status and milieu and then predicting from aggregate data of population characteristics that successful educational experiences at a latter date will not occur.

Planned intervention is aimed at altering this projected course of growth. The introduction of planned experiences as preparatory to entering the educational mainstream had in the past years as its major rationale the concept of a deficit model of functioning, be it cognitive or affective.

Intervention in our program at the University of Virginia applies to all children. We apply levels of development in the areas of social, motor, visual percpetual, cognitive and language.

We view the growth of the child as a system of hierarchially integrated structures from every area of development, and how these areas of development affect each other at various points in the developmental sequence. Developmental learning is a continually active process in which experience structures the areas of development - it refines motor skills and it organizes the mind of the child as he assimilates and accommodates new experiences.

Level of development within a specific area of development indicates the intervention for that level. However, one must consider the interactive effect of one area of development upon another.

In Sigel's discussion (1972) of sensitizing teachers, programmers and evaluators to the developmental issue of programmatic factors he gives the example of a study he conducted with Patricia Olmstead:

They found that when children had a training program initially in exploring object characteristics and categorization skills, and followed a year later by an attention-training program in which specific object characteristics were emphasized, gains made after the initial training were undone, while when attending training preceded categorization training, sequence, classification followed by attention, resulted in the attention training program inhibiting the effects of classification training, whereas attention training preceding classification training tended to facilitate classification training (Sigel and Olmstead 1971).

When and how do we intervene? What does this do to the vertical and horizontal intersystemic relationship in the area of development.

We assume one cannot teach anything to anybody. We adopt the Piagetian viewpoint that behavior can be modified only when the individual has the necessary cognitive, language or motor structues. Once the structues and behaviors are there -- they can be modified by:

1. accelerate--by enhancing, increasing and complexity
2. eliminated
3. broadened at the same level
4. and the possibility that some processes are irreversable and once acquired cannot be undone.

Before one can intervene one must be aware of the developmental ontogenies of child growth. The areas we have discussed today would

infer knowledge of the major dimensions of motor development, (gross, fine, and visual perceptual) and of language acquisition which are (auditory discrimination)(phonology, semantics, vocabulary and syntax or grammar). The expressive skills of speaking and writing and the receptive skills, listening and reading are primary concerns.

Teachers must be able to assess developmental levels in these areas and be able to utilize this information in prescribing experiential educational setting to assist the child's development. According to Fowler (1971) an experience curriculum infers stimulation from four sources. These include 1) the patterning of the physical environment; 2) the child's own activity in manipulating the dimensions of the physical environment; 3) the world of stimulation from peers and adults; and 4) the child's own activity in interacting with these two social sources of stimulation.

The following is a developmental curriculum model that can meet the needs of children with or without developmental discrepancies.

Curriculum

This model is based on the major areas of development and uses concept development as its core. It assumes that perception is the basis of learning. Strauss (1947) discussed methods of teaching brain injured children - defines perception as "the mental process which gives particular meaning and significance to a given sensation and therefore acts as a preliminary to thinking." It is through auditory and visual perception, sensory motor, taste and smell experiences that the individual organizes and understands his environment.

The sensory systems therefore become the modes for perception to develop the conceptual understandings of ones environment.

The study, then, of the development of the child's perceptual capacities is essential to an understanding of the way in which the child establishes and maintains contacts with the world around him.

There are few if any carefully designed research studies that examine the best methods of training the preschool child to help bridge the gaps caused by unevenness in development.

It has been the hypothesis of several authorities (Caldwell, 1956); Albetriccia, 1958; Francis-Williams, 1970; Lehtinen, 1955; Graham , 1965) that it is the integration of the senses - particularly of language with the motor processes. This does not discount the extra practice of motor skills, however, it is the language added to the motor practice that assists the growth.

The basis of this developmental curriculum is concept development. A concept is selected such as apples, sharing, family, etc. And then the classification and relational concepts related to the major concept are identified. The major areas of conceptual development are as follows: 1) Properties - What is it like?; 2) Positional - Where is it?; 3) Opposites - differences - How is it different?; 4) Quantification - How much is it?; 5) Comparisons - How different is it?; 6) Associations - related ideas; 7) Time; 8) Motion - How does it move?

Appropriate classification concepts are selected to emphasize. The teacher will prepare a physical environment that will elaborate the vocabulary she selects.

Properties of the Concept
These are classification concepts

1. Sight
   a. Size - big, little, long, short, tall, wide, tiny, narrow.
   b. Shape - 2 & 3 dimension, round, square, cylinder, sphere, cube, pyramid.
   c. Color - primary, secondary
   d. Condition - old, new, shiney
   e. Composition - wood, plastic, metal, knitted, cloth, etc.
   f. Major parts
   g. Function - What is it used for?

Can also tell all of the above except color and condition.

2. Touch - shape, texture, temperature, and weight
   a. Texture - hard, soft, pliable, rigid, furry, sandy, rough, smooth, waxy, sticky, mucky, wet, dry, gritty, rubbery, slick, glassy, goey, scratchy, prickly, slippery, mushy.
3. Taste - texture, sweet, sour, (cooked, uncooked), delicious, crisp, tart, spicy, greasy, gooey, bitter.
4. Smell - pleasant, unpleasant, odor, smell, spicy, sweet, pungent, strong, mild, scent.
5. Hear - What sound does it make? rattle, pop, screech, buzz, loud, soft, sharp, quiet, shrill, clap, bump, hiss, clear, low, high, muffled, ring.
6. Emotion and Feelings - afraid, proud, anxious, troubled, grateful, ashamed, lonesome, joyful, wanted, loved, bad, please, hopeful, happy, sad, angry, confident, wicked, faithful, upset, tearful, bashful, selfish, haughty, peaceful, poor, annoyed, good.

The teacher then emphasizes positional concepts that relate to the main concept. Positional concepts are: in, out, through, beside, there, under, on, around, behind, below, above, far, near, close, flat, upright, over, on top, beneath, high, low, left, right, north, south, east, west, top, middle, before, after, between, slanted, slanting, diagonal, next to, away, and between. An example of the use of a positional concept is "Get away from that desk!"

The teacher will then select opposite and contrasting conditions relating to the main concept. Examples of opposites and contrasting conditions are: same-different, left-right, hot-cold, right-wrong, stop-go, soft-hard, light-heavy, light-dark, wet-dry, big-small, night-day, short-long, over-under, rough-smooth, wide-narrow, clean-dirty fine-coarse, old-young, in-out, up-down, behind-ahead, high-low, big-little, loud-quiet, on-off.

Quantification experiences are selected relating to the main concept. These are: part-whole ralationships, number, weight and mass, volume, length-width-breadth, sequence, value(more than, less than, same as).

The teacher may also use comparison experiences relating to the main concept. Examples of comparison or"How are they different?" are: big-bigger-biggest; tall-taller-tallest; little-less-least; more-most; noise-noisier-noisiest; soft-softer-softest; loud-louder-loudest.

Time experiences may also be related to the main concept. Examples of time experiences are: 1) Words that express time concepts (time, clock, o'clock, minutes, hours, face, hands, day, seconds, morning, evening, night, lunchtime, numbers, noon, afternoon, early,

late.)2)Examples of specific time names are: days of the week, months, season, daily, seek, first, second, etc., weekend, today. 3) Examples of special days and holidays are birthday, weekend, etc. 4) Past-yesterday, Present -today, Future-tomorrow, next.

The teacher may also select motion experiences which are pertinent to the main concept. How do things move? Examples are marching, running, walking, hopping. "Ed" and "ting" tell whether its happening or has happened. "Ly" expresses action words (slowly, quickly, smoothly, quietly, gracefully, jerkily, lazily). Roach VanAllen's talk reemphasized this to me.

Indirect associational experiences which are pertinent to the major concept may be introduced. Examples of associations or related concepts would be : If the major concept is apples, introduce the book Johnny Appleseed, or if the major concept is letters, introduce the concept of the mailman. Can you think of any other related ideas to _____?

Once the teacher has established the concept and subclassifications and conceptual understandings to which she wishes to expose the children she looks at the other areas of development to determine how she can interrelate growth in these areas to the content of the concept. She is aware of major developmental outcomes in each specific area. From these she selects ones that are appropriate for the children and then selects learning strategies and content to implement them. In language development there are the following seven major areas: 1) Phonetic; 2) Semantic: 3) Syntax; 4) Auditory Perceptual skills; 5) Fluency; 6) Reading Readiness and 7) Expressive Writing.

Phonetic Developmental Outcomes

1. To be able to make sounds like those made by an adult model.
2. To develop clear articulation and the ability to express the 44 identified phonemes in standard American English (See diagram on following pages).
3. To learn the names of letters of the alphabet.
4. To learn the sounds of the letters of the alphabet.
5. To be able to associate graphic symbols of language with their letter names and sounds.
6. To learn the position of sounds - beginning, middle and ending.
7. To identify the correct order of letters of the alphabet.

Syntax Developmental Outcomes

1. To develop phrase components of grammatical structures.
2. To develop the child's ability to express himself using the identified grammatical patterns of standard English.
3. To develop the child's ability to ask questions as a means of seeking and gaining information.

Auditory Perceptual Skills Outcomes

1. Awareness of sound. To be able to determine was there a sound.
2. Focus of sound. To be able to determine where was the sound.
3. Figure-ground discrimination. To be able to determine if there was more than one sound.

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Phonemes in the English Language

The continuum on articulation between vowel-like and consonant-like sounds.

Consonant-like Sounds

Noncontinuant

Stops - a momentary which involves a complete stoppage of the breath stream and an interval of silence during the production. Examples of voiced and voiceless sounds in (p, b), (t, d), (k, g), and (ch, j).

(p) pin (t) tin (k) coal
(b) bin (d) din (g) goal

Fricatives - Sounds that are produced with enough constriction of the speech organs at some point in the mouth passage to cause a noticeable friction noise as the air squeezes through. The initial sounds of fine, vine, thigh, final, and ship, as well as the medial sound written with an s in pleasure, are fricative sounds.

(ĉ) church (h) house
(ĵ) judge (s) seal
(f) fine (z) zeal
(v) vine (š) shoe
(ϑ) think (ž) azure
(ð) this

Continuants

Laterals - The sound (l) in like, well, and milk is classified as a lateral sound. Lateral sounds are made by blocking the mouth passage with the tongue along a median line, leaving an opening along one or both sides for the breath stream to pass through.

(e) life

Resonants

Nasals - During the sound emission the nasal passage is kept open for the air to issue through the nose. Nasals are normally voiced sounds, like the initial sounds in mad, no and the final sound in ring, except that in words like mean and snow they may be partially "devoiced" because of the preceding voiceless consonant.

(m) man (ŋ) sing
(n) now

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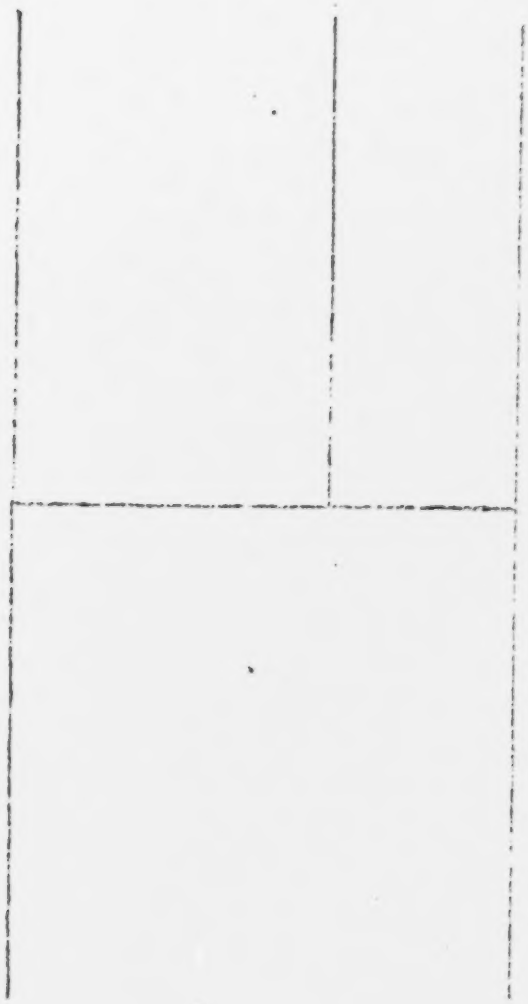

Semivowels or Glides - These sounds are characterized by a moving, rather than a stationary, tongue position as they move to and from the place where a speech sound is articulated. The sounds represented by written y, w, and r as in yet, well, and red are generally regarded as glides. Also the final sounds in cow and low which are usually represented by the symbols (j) and (w).

(w) water
(r) red
(j) yes

Vowels - When producing these sounds the continuous airstream is unobstructed. Below are the cardinal vowels as they relate to American English.

(i) beat
(ɪ) bit
(ɛ) bet
(æ) bat
(a) car
(ɨ) bit
(ʌ) just
(ə) about
(ɜ) (ɝ) bird
(ʊ) book
(ʌ) but
(u) boot
(o) boat
(ɔ) bought
(ɑ) pot

4. Auditory discrimination. (a) To be able to determine if the sounds were the same or not the same. (b) to identify rhyming words. (3) to distinguish the sounds of the various phonemes.
5. Discriminate degree of sound. To be able to identify loud and soft sounds.
6. Sequencing and synthesizing sound. (a) To be able to determine what was the sequence of sounds? (b) To be able to determine what was the length of time between sounds. (first, next, last).
7. Classification, integration and monitoring of sound. What do the sounds and words mean? (a) To distinguish and identify common sounds in the environment. (b) To associate meanings with spoken words. (c) To obtain meaning from sentence structure. (d) To follow simple explanations; carry out one-step directions given orally - then two-step directions, etc. (e) To gain an understanding of what to look and listen for in experiences; "tune in" when directed to.
8. Auditory memory. Short and long term recall which involves several auditory skills. To identify the sounds of the various phonemes.

Fluency Developmental Outcomes

To develop the child's ability to verbalize eagerly and with ease.

Reading Readiness Learner Outcomes

Reading skills include all the specific outcomes identified in auditory discrimination, phonetics, semantics, and syntax. These all provide the base for the reading porcess. Additional skills that are not specifically developed in the other areas are as follows:

1. To develop the concept that "reading is talk written down" (that it has picture symbols).
2. To develop a desire for books - literacy appreciation.
3. To be able to put a series of pictures or events in proper sequence.
4. To be able to retell a story in proper sequence.
5. To develop a sight word vocabulary.

Related outcomes in other modules include:

1. To lengthen child's attention span (attending module)
2. To develop visual discrimination abilities
3. To develop ability to see perceptual relationships.
4. The ability to follow a left to right sequence.

Developmental Writing Outcomes

Writing skills.

To be able to make visually distinct patterns.
Copy the pattern of an incomplete outline of a picture or letter (complete the outline using finger, crayon, or pencil.)
Complete the last pattern of a repeating pattern of items by supplying the missing item or items.

To know the letters of the alphabet.
Copy uppercase and lowercase letters from a model.
Match the uppercase and lowercase forms of the letters of the alphabet.
Write own first name using a model.

Reproduce from memory all twenty-six letters of the alphabet.

To be able to communicate thoughts in complete sentences.

Copy a complete sentence.
Copy words, groups of words, and complete sentences.
Write given sentences from dictation.
Write phrases that describe location.
Transform declarative sentences into interrogative sentences.
Given simple sentences and phrases, write expanded sentences by adding descriptive words.
Using descriptive words to express an oral or written idea.
Write sentences using words child has located in a dictionary.

Original writing.

To be able to use descriptive words or phrases.

Recognize more than one word to describe something.
Recognize the adjective which best describes a given character in a story.
Write descriptive words, or phrases, and sentences.
Apply the use of descriptive words or phrases in creative writing.
Use a variety of words to express action and sound in speaking and writing.
Apply the use of alliteration in creative writing.
Write a real, imaginary, or new name for a given thing.

To be able to combine concepts, principles, and generalizations by writing original stories.

Write a story child has read or heard and change the ending.
Given a question asking how or why, write a myth at least one sentence in length.
Write a make-believe story of at least three sentences with a beginning, middle, and end.
Write a fictional paragraph about people, animals, places, or things.
Write a paragraph in which a character is described and developed.
Write a story that tells who, what, where, when, and why.
Write a story using story-starter words, phrases, or pictures.
Given a story starter, write an adventure story using descriptive words.
Write a true adventure story and tell it to a class or a small group.
Write a make-believe story.
Write a story using a topic you have selected as the main role.
Read several stories of fantasy, and then write your own tale of fantasy.

To be able to combine concepts, principles, and generalizations by writing original poems.

Write a poem of at least one rhyming couplet.
Write a poem from a given list of topics.

To be able to combine concepts, principles, and generalizations by organizing factual information.

Write a simple biography, including the person's name and at least two other facts about the person.
Write a factual paragraph about people, animals, places, or things.

LESSON PLAN

Activity
1. Learner Outcome
2. Conditions
    a. learner characteristics
    b. situational variables
    c. strategy
    d. content

Date _____

LEARNER OUTCOME _____

NAME	achieved	not achieved	uncertain classification	COMMENT
Sandy				
John				

To assess the growth of the child in relation to the outcome a form is filled out for each conceptual understanding and each outcome identified under the major areas of development. The teacher then decides which outcomes are appropriate for the various children according to their individual developmental levels. She then lists the child's name on the appropriate outcome and daily checks or makes a comment as to the child's growth in relation to the specific learner outcome.

Motor development

Motor development is basically divided into three major areas: gorss motor, fine (which involves visual motor tasks) and visual perception.

Gross motor development involves refining coordinated movement of body parts used involuntarily to achieve an objective. Follwoing are identified gross motor movements that are achieved by young children. Gross motor learner outcomes are 1) body image; 2) walking, climbing, creeping, galloping, kicking, skipping, hanging, sliding, ball catching, ball throwing, tricycle, jumping, hopping, running, leaping, swinging, stretching, bending, pushing, pulling, twisting, turning, shaking, bouncing, carrying, bouncing a large ball, bouncing on a board, ascending stairs, and descending stairs.

Fine motor skills can be subdivided into two areas - motor tasks involving self help skills and perceptual motor tasks that are more school oriented.

Visual motor systems involve visual perception abilities of fixation, focusing and visual pursuit, eye-arm and eye-hand coordination with the addition of self help motor tasks (buttoning, hooking, tying, fastening, brushing and combing hair, bathing, brushing teeth). School related perceptual motor tasks include cutting, writing, drawing, copying, tracing, block building, and cutting.

Visual Perceptual Learner Outcomes

ATTENDING
develops from a relatively fixed or forced activity to an exploratory activity, which progresses toward selective systematic and flexible patterns of search that are adapted to the task.

- fixation
- following
- focussing-actually inspecting the environment (able to shift gaze) rather than just fixation on object.
- visual pursuit - organization of perceptual patterns.
  - a. figure ground - being able to perceive shape against complex grounds.
  - b. constancy of shape-being able to recognize shape in various sizes, shadings, textures and positions in space.
  - c. position in space - being able to discriminate reversals and rotations of figures.

Conclusion

The curriculum model described here is considered to be a multi-sensory learning system in that experiences of the areas of development are related to the concept being taught (motor, language, cognitive, and social). It is a compilation of open-ended, yet structured resource materials and experiences around a specific concept.

Media include organic objects, artifacts, children's literature, movies, films, filmstrips, slides, tapes, music, sound objects, art reproductions, sculpture, toys, art media for creating purposes, and any other object which reinforces the learning of the concept.

The teacher serves as a facilitator who raises open and closed questions and gives informative feedback to the child's verbalizations. If a teacher prepares an environment and experiences that provide the developmental "match" that J. McVicker Hunt speaks of so children are always developing and refining language, cognitive, motor percpetual skills and she is providing a developmental curriculum. She can only do this if she knows the developmental levels of her children which infers she must be a developmental diagnostician and then be able to implement an environment based on the knowledge she gleans from the diagnostic tests.

The curriculum model briefly discussed in this paper is the basis of planning such a developmental curriculum. The system spirals in a developmental nature in that every child interacting with the media can gain further knowledge of the concept intended by building fine discriminating classification systems. Outcomes should be set for each child so the child will be sitmulated and motivated to learn, however, since no two children experience the primary data in the same way, one can not always predict the learning that will occur from a prepared environment.

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